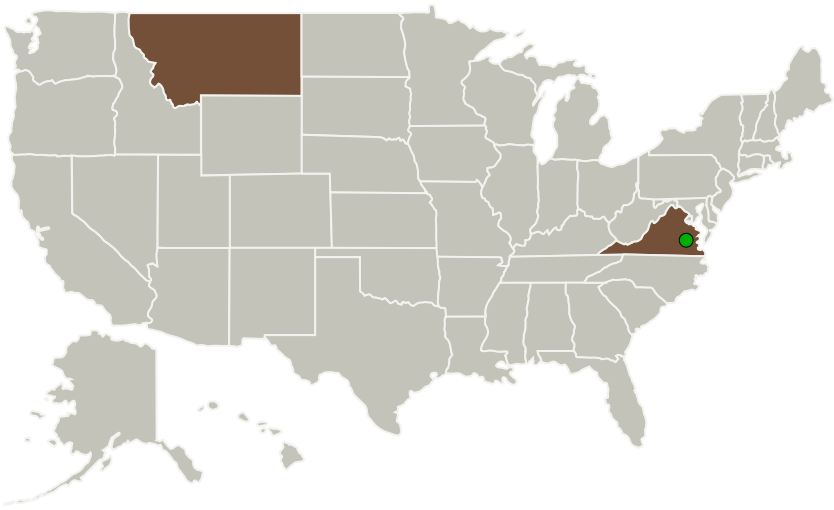
# Utilization of the International Space Station to Verify Photonic Devices for Enhanced Space-Based Atmospheric Profiling, Phase I

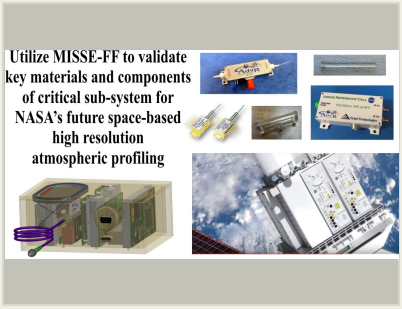
Completed Technology Project (2017 - 2017)

## Project Introduction

The overall goal of the SBIR effort is completion of Technical Readiness Level (TRL) 5, component validation in a relevant environment, of the key photonics devices for a diode-based, locked wavelength, seed laser system currently being developed for space-based, High Spectral Resolution Lidar (HSRL) measurements. To achieve this goal, AdvR is proposing to the utilize the Materials International Space Station Experiment (MISSE-FF) Flight Facility for accelerated and accurate testing of the key materials and components of the seed laser system, all of which have been successfully integrated into NASA High Spectral Resolution Lidar (HSRL) flight missions, but none of which have been in a space environment. Exposure and successful operation of AdvR developed materials and devices in a relevant space environment will complete the TRL 5 requirements for this technology and allow advancement to TRL 6 for the system, thus directly addressing the need for space technologies already developed under the NASA Langley SBIR Program that would mature in TRL due to successful demonstration in the space environment, as described in the NASA SBIR topic H8.01 ISS Utilization and Microgravity Research.

## Primary U.S. Work Locations and Key Partners






Utilization of the International Space Station to verify photonic devices for enhanced space-based atmospheric profiling, Phase I Briefing Chart Image

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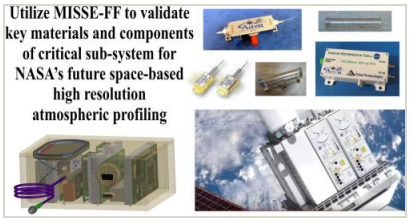
| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ADVR, Inc. | Lead Organization | Industry | Bozeman, Montana |
| Langley Research Center(LaRC) | Supporting Organization | NASA Center | Hampton, Virginia |

| Primary U.S. Work Locations | |
|---|---|
| Montana | Virginia |

## Images




**Briefing Chart Image**
Utilization of the International Space Station to verify photonic devices for enhanced space-based atmospheric profiling, Phase I Briefing Chart Image *(https://techport.nasa.gov/image/131943)*

## Organizational Responsibility

**Responsible Mission Directorate:**
Space Technology Mission Directorate (STMD)

**Lead Organization:**
ADVR, Inc.

**Responsible Program:**
Small Business Innovation Research/Small Business Tech Transfer

## Project Management

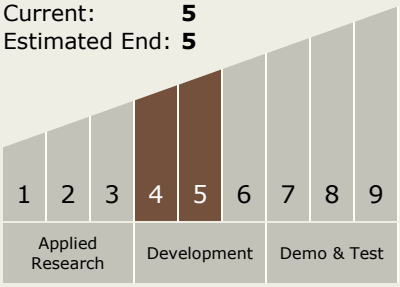
**Program Director:**
Jason L Kessler

**Program Manager:**
Carlos Torrez

**Principal Investigator:**
Shirley Mcneil

## Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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## Technology Areas

**Primary:**

- TX05 Communications, Navigation, and Orbital Debris Tracking and Characterization Systems
  - TX05.1 Optical Communications
    - TX05.1.1 Detector Development

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System